

I. COURSE INFORMATION:

Department Information
Division: Transportation
Department: Diesel Technology
Course ID: DIESEL 035
Course Title: Allison World Transmission
Units: 2
Lecture: 1.5 Hours
Laboratory: 1.5 Hours
Prerequisite: None

Catalog and Schedule Description: This course provides theory and hands on experience with Allison World Transmission operation, construction, service and overhaul procedures. The purpose of the class is to prepare the students to successfully troubleshoot and repair Allison World Transmissions as well as other medium and heavy duty vehicle automatic transmissions. Classroom topics include, but are not limited to: torque converter, power flows, vehicle interfaces, and troubleshooting. Lab work will consist of disassembly, inspection of all parts, and transmission reassembly.

II. NUMBER OF TIMES COURSE MAY BE TAKEN FOR CREDIT: One

III. EXPECTED OUTCOMES FOR STUDENTS:

Upon successful completion of the course, the student should be able to:

- A. Describe the theory and operation of medium and heavy duty automatic transmissions.
- B. Diagnose and repair mechanical, electrical and electronic transmission components.
- C. Evaluate transmission performance.
- D. Maintain heavy and medium duty automatic transmissions per OEM requirements.
- E. Utilize diagnostic tools to inspect, repair and adjust medium and heavy duty automatic transmissions.

IV. CONTENT:

- A. Introduction to different models and special tools
 - 1. Workshop Safety
 - 2. Use of measuring tools
- B. Torque converter operation
 - 1. Component identification
 - 2. oil flows
- C. Planetary gears
 - 1. planetary laws
 - 2. power flows
- D. Hydraulics: use of hydraulic flow charts
- E. Basic Electricity: Use of an DVOM and jumper wire set
- F. Electronic Controls: Operation of sensors, electronic control unit
- G. Vehicle Interface: Reading Electrical schematics
- H. Diagnostic codes: Accessing and clearing codes
- I. Preventive Maintenance
 - 1. procedure for oil and filter changes
 - 2. visual inspection
- J. Removal and installation: Adaptation checks
- K. Disassemble, inspect and repair parts which are reusable, and assemble in a manner consistent with accepted trade practices.
- L. Driveline Checks

V. METHODS OF INSTRUCTION:

- A. Lecture and direct laboratory demonstration by instructor and students.
- B. Lab work
- C. Classroom participation

VI. TYPICAL ASSIGNMENT:

- A. Reading Assignments: Principals of Operation 4th Paragraph
"The Torque converters operates Hydraulically and transfers torque from the engine to the Transmission."
- B. Critical Thinking Assignments: Hands on lab and classroom work.
"Disassemble Torque Converter Inspect, Measure and Qualify parts for reuse
Re-assemble Converter.

VII. EVALUATION:

- A. Methods of Evaluation: Multiple choice tests, and weekly assignments.
- B. Frequency of Evaluation:
 - 1. Weekly assignments; 1 midterm and 1 final exam
 - 2. Typical Test Questions:
 - a) The torque converter:
 - i. Has a pump that always turns at engine speed
 - ii. Turbine and turbine shaft rotate at equal speeds only during cool down
 - iii. Stator is free to lockup or free wheel in either direction of rotation.

VIII. TYPICAL TEXTS:

- A. MD Service Manual; Part number SM2148EN
- B. World Transmission WTEC III Troubleshooting Manual; Part number TS2973EN
- C. Principals of Operation; Part Number PO2454EN

IV. OTHER SUPPLIES REQUIRED OF STUDENTS: Notebook and safety glasses.